CLAIMS:

1. A Radio Frequency Identification (RFID) tag or label comprising:

a RFID tag module comprising an electronic identification circuit and a coupling means; and

an antenna structure coupled to the coupling means,

wherein the RFID tag module is separate from, separable or arranged to be severable from, the antenna structure.

2. A RFID tag or label according to claim 1, wherein the coupling means comprises an antenna connected to, or integral with, the RFID tag module.

3. A RFID tag or label according to claim 1 or 2, wherein the antenna structure is coupled to a further electronic identification circuit.

4. A RFID tag or label according to claim 3, wherein the further electronic identification circuit is integral with, or substantially permanently attached to, the antenna structure.

5. A RFID tag or label according to any of claims 1 to 4, wherein the antenna structure increases the effective aperture of the RFID tag module.

6. A RFID tag or label according to any of claims 1 to 5, wherein the antenna structure improves the ability to communicate with the RFID tag module, and/or increases the range over which the RFID tag module can be communicated with, and/or improves the ability to communicate with the RFID tag module in multiple directions.

7. A RFID tag or label according to any of claims 1 to 6, wherein the antenna structure and the RFID tag module are matched to each other.

8. A RFID tag or label according to any of claims 1 to 6, wherein the antenna structure and the RFID tag module are not matched to each other.

9. A RFID tag or label according to any of claims 1 to 8, wherein the antenna structure is resonant.

10. A RFID tag or label according to any of claims 1 to 8, wherein the antenna structure is not resonant.

11. A RFID tag or label according to any of claims 1 to 10, wherein the antenna structure has a gain.

12. A RFID tag or label according to any of claims 1 to 11, wherein the RFID tag module comprises a transponder.

13. A RFID tag or label according to any of claims 1 to 12, wherein the coupling between the coupling means and the antenna structure is a non-contact coupling.

14. A RFID tag or label according to claim 13, wherein the antenna structure is coupled to the coupling means by means of a coupling selected from the group consisting of electromagnetic coupling, inductive coupling and capacitive coupling.

15. A RFID tag or label according to any of claims 1 to 12, wherein the antenna structure is coupled to the coupling means by means of a galvanic connection.

16. A RFID tag or label according to claims 15, wherein the galvanic connection is provided with a preferred line of fracture.

17. A RFID tag or label according to any of claims 1 to 16, wherein the antenna structure comprises a sheet of metal foil.

18. A RFID tag or label according to claim 17, wherein the sheet of foil has a lip for coupling with the coupling means.

19. A RFID tag or label according to any of claims 1 to 16, wherein the antenna structure comprises a metal rod or wire.

20. A RFID tag or label according to claim 19, wherein the metal rod or wire is straight.

21. A RFID tag or label according to claim 19, wherein the metal rod or wire is multidimensional.

22. A RFID tag or label according to claim 21, wherein the metal rod or wire is substantially straight over a first portion and extends at substantially right angle thereto over a second portion.

23. A RFID tag or label according to any of claims 1 to 16, wherein the antenna structure comprises a dipole, folded dipole, loop, slot or patch antenna.

24. A RFID tag or label according to any of claims 1 to 16, wherein the antenna structure comprises a plurality of antenna elements.

25. A RFID tag or label according to claim 24, wherein the plurality of antenna elements are substantially parallel to, and spaced from, each other.

26. A RFID tag or label according to claim 25, wherein the spacing between the antenna elements is $\lambda/4$ or $\lambda/6$, wherein λ is the wavelength corresponding to the operating frequency of the RFID tag module.

27. A RFID tag or label according to claim 26, wherein the antenna structure comprises a YAGI antenna.

28. A RFID tag or label according to claim 24, wherein the plurality of antenna elements are substantially non-parallel.

29. A RFID tag or label according to any of claims 1 to 28, wherein at least one dimension of the antenna structure is substantially an odd multiple of $\lambda/2$, λ being the wavelength corresponding to the operating frequency of the RFID tag module.

30. A RFID tag or label according to any of claims 1 to 29, wherein the RFID tag module is constructed such that it can substantially not be communicated with when it is not coupled to the antenna structure.

31. A RFID tag or label according to any of claims 1 to 29, wherein the RFID tag module is constructed such that it can be communicated with when it is not coupled to the antenna structure.

32. A RFID tag or label according to claim 31, the distance over which it can be communicated with when it is not coupled to the antenna structure being d0, the distance over which it can be communicated with when it is coupled to the antenna structure being d1, wherein d1 is substantially larger than d0.

33. A RFID tag or label according to claim 32, wherein d1 is at least 2, preferably 5, more preferably 10 and yet more preferably 20 times as large as d0.

34. A RFID tag or label according to any of claims 1 to 33, wherein the RFID tag module is integral with, or attached to, an item, and the antenna structure is integral with, or attached to, packaging material used for the item.

35. A RFID tag or label according to any of claims 1 to 34, wherein the RFID tag module can be communicated with by close proximity means without galvanic contact.

36. A RFID tag or label according to any of claims 1 to 35, wherein, in the absence of the antenna structure, the RFID tag module has a first operating frequency, and when the antenna structure is coupled to the coupling means the RFID tag or label has a second operating frequency, wherein the first operating frequency is different from the second operating frequency.

37. An object for use with a first Radio Frequency Identification (RFID) tag module, the object comprising an antenna structure which is integral with, or attached to, the object and which is arranged

to improve the ability to communicate with the first RFID tag module, and/or

to increase the range over which the first RFID tag module can be communicated with, and/or

to improve the ability to communicate with the first RFID tag module in multiple directions

when the first RFID tag module is used in combination with the object so as to form a first RFID tag or label.

38. An object according to claim 37, further comprising a second RFID tag module which is coupled to the antenna structure, so as to form a second RFID tag or label.

39. An object according to claim 37 or 38, wherein the second RFID tag module is connected to the antenna structure by means of a galvanic connection.

40. An object according to claim 38 or 39, wherein the second RFID tag module is integral with, or substantially permanently attached to, the remainder of the object.

41. An object according to any of claims 37 to 40 when used in combination with said first RFID tag module so as to form said first RFID tag or label.

42. An object according to any of claims 37 to 41 when used in combination with one or more further RFID tag modules so as to form one or more further RFID tags or labels, wherein the antenna structure is arranged

to improve the ability to communicate with the further RFID tag module(s), and/or

to increase the range over which the further RFID tag module(s) can be communicated with, and/or

to improve the ability to communicate with the further RFID tag module(s) in multiple directions.

43. An object according to any of claims 37 to 42, wherein said object comprises a transport means.

44. An object according to claim 43, wherein said object comprises a container or a pallet.

45. An object according to claim 43 or 44 as directly or indirectly dependent on claim 40, wherein said first RFID tag module and, where provided, said further RFID tag modules is/are carried by items arranged to be transported by said object.

46. A method of manufacturing a RFID tag or label, comprising:

providing a RFID tag module comprising an electronic identification circuit and a coupling means; and

coupling an antenna structure to the coupling means,

wherein the RFID tag module is separate from, separable or arranged to be severable from, the antenna structure.

47. A method of operating a Radio Frequency Identification (RFID) system, comprising:

providing a RFID tag in which a RFID tag module is coupled to an antenna structure; and

separating or severing the RFID tag module from the antenna structure.

48. A method according to claim 47, further comprising communicating with the RFID tag module via a galvanic connection after it has been separated or severed from the antenna structure.

49. A method according to claim 47 or 48, further comprising coupling the RFID tag module to a further antenna structure after it has been separated or severed from the antenna structure.

50. A method according to claim 49, wherein the RFID tag module can be communicated with by a suitable RFID communication means after it has been coupled to the further antenna structure.

51. A method according to claim 50, wherein the RFID tag module cannot be communicated with by said RFID communication means after it has been separated or severed from the antenna structure and before it has been coupled to the further antenna structure.

52. A method according to any of claims 49 to 51, wherein the further antenna structure is the same as the antenna structure.

53. A Radio Frequency Identification (RFID) system comprising:

at least one Radio Frequency Identification (RFID) tag or label comprising:

a RFID tag module comprising an electronic identification circuit and a coupling means; and

an antenna structure coupled to the coupling means,

and

at least one RFID communication means,

wherein the RFID tag module is separate from, separable or arranged to be severable from, the antenna structure.

54. A system according to claim 53, wherein the RFID tag module can be communicated with by means of a first said RFID communication means when the antenna structure is coupled to the coupling means, and can be communicated with by means of a second said RFID communication means when the antenna structure is not coupled to the coupling means, but cannot be communicated with by means of the first

said RFID communication means when the antenna structure is not coupled to the coupling means.

55. A system according to claim 53 or 54, wherein the RFID communication means comprises a RFID reader.

56. An antenna structure for use in a RFID tag or label comprising a RFID tag module and a said antenna structure, the antenna structure comprising:

a metallic material of such characteristics that, when brought into a coupling relationship with the RFID tag module,

it improves the ability to communicate with the RFID tag or label and/or

it increases the operating range of the RFID tag or label and/or

it improves the ability to communicate with the RFID tag or label in multiple directions,

wherein the antenna structure is not galvanically connected to the RFID tag module.

57. An antenna structure according to claim 56, wherein the antenna structure is connected to, or integral with, packaging material.

58. An object comprising a Radio Frequency Identification (RFID) tag module which is integral with, or attached to, the remainder of the object and which is for coupling to a suitable antenna structure so as to form a RFID tag or label, wherein, when the RFID tag module is coupled to a suitable antenna structure,

the ability to communicate with the RFID tag module is improved, and/or

the range over which the RFID tag module can be communicated with is increased, and/or

the ability to communicate with the RFID tag module in multiple directions is improved,

when compared with a situation in which the RFID tag module is not coupled to a suitable antenna structure.

59. An object according to claim 58, wherein the RFID tag module can substantially not be communicated with unless it is coupled to a said antenna structure.

60. An object according to claim 58 or 59, wherein the RFID tag module is in such a way integral with, or attached to, the remainder of the object that it cannot be connected to a said antenna structure by a galvanic connection.

61. A Radio Frequency Identification (RFID) tag comprising:
a patch antenna defining a first plane; and
a second plane spaced from the antenna,
wherein the area spanned by the second plane is not substantially larger than the area spanned by the patch antenna.

62. A RFID tag according to claim 61, wherein the area spanned by the second plane is less than 2.5 times the area spanned by the patch antenna, preferably less than 2 times, more preferably less than 1.5 times and yet more preferably less than 1.2 times the area spanned by the patch antenna.

63. A RFID tag according to claim 61 or 62, wherein the second plane is flexible.

64. A Radio Frequency Identification (RFID) tag comprising:
a patch antenna defining a first plane; and
a second plane spaced from the antenna,
wherein the second plane is flexible.

65. A RFID tag according to claim 63 or 64, wherein the second plane comprises a mesh.

66. A RFID tag according to claim 63 or 64, wherein the second plane comprises a foil.

67. A RFID tag according to any of claims 63 to 66, wherein the second plane is flexible to such an extent that it can be comfortably worn by a human or animal.

68. An object for use with a Radio Frequency Identification (RFID) tag module, the object comprising a metallic structure which is integral with, or attached to, the object and which is arranged to increase the efficiency of a said RFID tag module and/or to improve the ability to communicate with the RFID tag module and/or to increase the operating range of the RFID tag module and/or to improve the ability to communicate with the RFID tag module in multiple directions when the RFID tag module is used in combination with the object so as to form a Radio Frequency Identification (RFID) tag.

69. An object according to claim 68, further comprising means for receiving a said RFID tag module.

70. An object according to claim 68 or claim 69, wherein the metal structure comprises a ground plane for use with a patch antenna.

71. An object according to claim 68 or claim 69, wherein the metal structure comprises a driven antenna element and/or a reflector and/or a director element for use with a RFID tag so as to form a YAGI antenna structure.

72. An object according to any of claims 68 to 71, wherein the metal structure is moulded into or onto the object.

73. An object according to any of claims 68 to 72, further comprising a said RFID tag module integral with the object.

74. An object according to any of claims 68 to 73, comprising a RFID tag according to any of claims 61 to 67.

75. A RFID tag according to any of claims 61 to 67, wherein the patch antenna is supported and strong enough so as to withstand substantial forces in a direction perpendicular to its surface.

76. A Radio Frequency Identification (RFID) antenna structure comprising:
a patch antenna defining a first plane; and
a second plane spaced from the antenna,
wherein the patch antenna is supported and strong enough so as to withstand substantial forces in a direction perpendicular to its surface.

77. An antenna structure according to claim 75 or 76, being placed on the ground or a floor.

78. An antenna structure according to claim 77, being able to be walked upon or driven over without suffering any substantial damage.

79. An antenna structure according to claim 75 or 76, being placed at a rear portion of the fork of a fork lift truck.

80. An antenna structure according to any of claims 75 to 79, wherein the spacing between the antenna and the second plane is between 3 and 5 mm, preferably about 4mm.

81. An antenna structure according to any of claims 61 to 67 or 75 to 80, wherein the second plane is electrically insulated from the patch antenna.

82. A Radio Frequency Identification (RFID) tag antenna structure comprising:
a patch antenna; and
a ground plane spaced from the antenna,
wherein the ground plane is electrically insulated from the patch antenna.

83. A Radio Frequency Identification (RFID) tagging method comprising incorporating a patch antenna defining a first plane and a second plane spaced from the antenna into a piece of clothing.

84. A method according to claim 83, wherein the patch antenna and second plane is as defined in any of claims 61 to 67, 75, 76 or 82.

85. A YAGI type Radio Frequency Identification (RFID) tag comprising:

a RFID tag module;

an antenna element coupled to the RFID tag module; and

at least two director elements, at least one on each of two opposite sides of said antenna element, whereby the RFID tag is able to communicate in two opposite directions.

86. A RFID tag according to any of claims 61 to 67, 75 or 85, or an antenna structure according to any of claims 76 to 82, being operable at UHF frequencies.

87. A RFID tag according to any of claims 61 to 67, 75 or 85, or an antenna structure according to any of claims 76 to 82, being operable at 869 MHz.

88. A RFID tag or label, an antenna structure, an object, a system or a method, substantially as any one herein described with reference to, or as illustrated in, the accompanying drawings.